DOCUMENT RESUME

ED 153 784 PS 009 914

AUTHOR Morrison, Sherry B.; Oxford, Rebecca L.
TITLE Classroom Ecology and Kindergarten Students' Task-Related Behaviors: An Exploratory Study.
SPONS AGENCY North Carolina Univ., Chapel Hill. Frank Porter Graham Center.
PUB DATE Mar 78
NOTE 24p.; Paper presented at the Annual Meeting of the American Educational Research Association (Toronto, Canada, March 27-31, 1978)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Attention Control; Behavior Patterns; Behavior Rating Scales; *Class Management; *Classroom Environment; *Classroom Techniques; Class Size; Early Childhood Education; Group Activities; *Group Behavior; Group Dynamics; *Kindergarten; Observation; Peer Relationship; *Student Behavior; Task Performance; Teacher Role
IDENTIFIERS Classroom Ecology Scale; Schedule for Classroom Activity Norms

ABSTRACT

This paper reports on an investigation of the interdependent relationship between ecological classroom dimensions and kindergarten students' task-related classroom behaviors, studied independently of personalities or age-group generalizations. Major purposes of the study were: (1) to identify and describe the main action structures observed in the classrooms and (2) to examine the effects of these action structures on students' off-task behavior. Twenty children, randomly selected from four kindergarten classes (age range, 69-77 months), were observed through use of a revised version of a 13-dimension behavior scale, the Schedule for Classroom Activity Norms (SCAN). Classroom milieu dimensions (lesson concern, teacher role, pupil activity, group size, pupil-pupil relationship, action sequencing, pupil choice and number of teachers) were simultaneously observed through use of the Classroom Ecology Scale (CES). Each child was observed for two 10-minute periods on different days in an individual or small-group setting and in a large-group setting. Three typical action structures were found: independent seatwork; whole-class recitation; and continuous central signal emission (as in teacher reading or filmstrip). Significant differences were found among action structures, supporting the assumption that individual or group behavior cannot be adequately described without reference to setting. (BF)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED153744

Classroom Ecology and Kindergarten Students' Task-Related Behaviors: An Exploratory Study

Sherry B. Morrison and Rebecca L. Oxford

University of North Carolina at Chapel Hill

Printed in the United States of America

Paper prepared for presentation at the 1978 Annual Meeting of the American Educational Research Association, Toronto, March 27-31

Running head: Classroom Ecology and Behavior

PS009914

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Rebecca L. Oxford

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

Abstract

This investigation studied the interdependent relationship between ecological classroom dimensions and kindergarten students' task-related behaviors in academic activities. Three typical action structures were found: independent seatwork; whole-class recitation; and continuous central signal emission, as in teacher reading or filmstrip. Students were significantly more distractible, passive, and nonconstructive in whole-class recitation than in either independent seatwork or continuous central emission, substantiating the hypothesized importance of signal continuity for task-related behavior. Results supported the assumption that individual or group behavior cannot be adequately described without reference to setting and implied that teachers may need to see themselves as classroom setting managers.

Classroom Ecology and Kindergarten Students' Task-Related Behaviors: An Exploratory Study

The major premise of this paper is that the influences of the classroom environment on behavior can be studied independently of particular personalities or age-group generalizations. This study examines the relationship between eight ecological classroom dimensions and kindergarten students' off-task behavior. It also relates the findings to previous ecological studies done with children in various grades and presents implications of the results for teachers' behavior in the classroom.

Ecological psychology provides the four operating assumptions of this study. The first assumption is that the pattern of behavior will be basically the same regardless of who is in attendance and will be appropriate to the physical surrounding (Stodolsky, 1971). That is, setting influences on behavior can be studied independently of individual differences in personality or cognition. The second assumption is that an adequate description of the behavior of either individuals or groups must include description of the setting (Shulman, 1970). The third assumption is that education is an environmental enterprise and as such requires knowledge about environmental, program-with-milieu units and concepts (Gump, 1974). The fourth assumption is that techniques of

teacher management should be related to the properties of the setting, especially the properties of classroom tasks (Kounin & Doyle, 1975).

Ecological psychologists have increasingly turned their attention to the classroom. In observing third-grade classrooms, Gump (1967) found that small groups were more related to higher pupil involvement than large groups. Pupil involvement was highest for reading circle; lower for tests, instruction, and whole-class recitation; and lower yet for supervised study. Loss of a central group function through lags or transitions was positively related to pupil noninvolvement. In that study, Gump noted the presence of a phenomenon called "action structures", i.e., a cluster of particular classroom dimensions which almost invariably occurred together. Gump gave descriptive names to each of these multidimensional action structures. The seven most common action structures, which encompassed almost three-quarters of the total observation time, were: "isolated seatwork" (21% of total time observed), "whole-class recitation" (19%), "reading circle" (10%), "getting ready" (8%), "supervised study" (8%), "teaching reading" (4%), and "whole-class recitation and seatwork" (4%).

Kounin, Friesen, and Norton (1966) studied emotionally disturbed children in regular classrooms. They found that activity format affected pupil involvement and deviancy, with involvement higher and deviancy lower in recitation than in seatwork; however, simple duration of activities was unrelated to pupil involvement or deviancy. Grade level was found to affect pupil involvement and deviancy, with involvement increasing and deviancy decreasing with increase of grade level.

Two ecological studies in preschools (Kounin & Doyle, 1975; Kounin & Gump, 1974) examined the effects of particular characteristics of lesson formats on students' off-task behavior. Lessons were conceptualized as possessing signal systems, the external provisions of lessons which prod, orient, and support childrens' actions. Kounin and Gump (1974) identified continuity as a salient feature of a lesson's signal system. Kounin and Doyle (1975) found that one type of independent seatwork, the individual construction lesson, when properly organized, was able to provide continuous signals and thus diminished off-task behavior. Recitation with multiple, lengthy (10 seconds or more) lulls created discontinuity and thus increased off-task behavior.

The results of a third ecological study of preschool children (Sherman, 1975) add further support to the theory that the signal continuity of a lesson affects students' behavior. Disruptive glee occurred in lessons in which lags broke up the signal continuity. Nondisruptive glee appeared during lessons which had a continuous signal.

The major purposes of this study are (1) to identify and describe the main action structures which were observed in kindergarten classrooms, and (2) to examine the effects of these action structures on students' off-task behavior.

Method

Much of Gump's (1967, Note 1) ecological methodology was used in this study, such as: (a) tracking particular "target children" as moving markers for certain time periods in order to examine the relationship between setting and behavior; (b) naturalistic observation rather than experimental manipulation; (c) concern for interdependency of milieu and behavior; and (d) use of many of the same dimensions in coding the classroom environment, e.g., teacher role, group size, pupil-pupil relationship, action sequencing, pupil activity, and lesson concern.

However, there are several differences between this study and Gump's work. First, the following two classroom dimensions were added; pupil choice and number of teachers in segment. Second, many changes were made in Gump's classroom environment subcategories in order to describe aspects of the kindergarten classroom. The resulting observation instrument is known as the "Classroom Ecology Scale" or CES (Morrison & Oxford, Note 2). Third, the present investigators used an instantaneous-recording, time-sampling method, while Gump employed an all-day chronicle approach with time-lapse photography, stenomask dictation, and later transcription. Fourth, Gump utilized a simpler category system for student behavior, while the present researchers used a revised version of the 13-dimensional behavior scale known as the "Schedule for Classroom Activity Norms" or SCAN (McKinney, Mason, Perkerson & Clifford, 1975). The CES and the revised SCAN are described later.

Subjects

Twenty children, 10 boys and 10 girls, were randomly selected from four kindergarten classes. Mean age as of the observation month was 73.5 months with a range of 69 to 77. The sample was composed of 14 white children and 6 black children.

Observation Procedures

Using the SCAN and the CES, observations were taken on each child's behavior and on classroom milieu dimensions simultaneously by two trained recorders during academic activities. Since this was a kindergarten study, "academic" was defined broadly, i.e., it included any periods except those clearly designated as lunch, play, rest, or business.

The double, program-with-milieu observations were made every five seconds for 10-minute periods. The number of double observations totalled 4,800. Reliability checks were taken on ten different observations days. Interrater reliability averaged 92.8% on the SCAN and 97.5% on the CES.

Each child was observed for two 10-minute periods on different days. The aim was to observe each child in an individual or small-group setting (one to eight children present) and in a large-group setting (more than eight children present). For 17 of the 20 children, it was possible to make observations once in both settings. If group size changed during the 10-minute period, the group size which predominated during that period was used to classify the entire period for analysis purposes. This was a rare occurrence, however.

Instrumentation

Eight classroom dimensions are included in the CES: (a) lesson concern, (b) teacher role, (c) pupil activity, (d) group size, (e) pupil-pupil relationship, (f) action sequencing, (g) pupil choice, and (h) number of teachers in segment.

Lesson concern covers 17 categories, such as reading, arithmetic, language, orientation to day, sharing, story, and filmstrip. Teacher role pertains to the teacher's role in the segment in which the target child is located but not necessarily the teacher's relationship to the target child. This dimension includes 13 subdimensions such as recitation leader, instructor-lecturer, reader, equipment or media handler, and not in segment. Six categories are found under pupil activity: (a) attending to own events/materials with no product; (b) attending to own events/materials with own product; (c) attending to group events/materials with no product; (d) attending to group events/materials with own product; (e) attending to group events/materials with group product, and (f) no events/materials, as in a transition or lull period.

Group size refers to the number of people in the group, regardless of whether members of a group are working together. Pupil-pupil relationships include interdependent, as in group projects; private, as in working alone on seatwork; nonprescriptive, as in cleanups or transitions; and parallel, with all participants attending to one "central emitter" such as a filmstrip. Seven subdimensions are included in action sequencing: (a) no pace; (b) self pace/individual performance; (c) external pace/no

performance; (d) external pace, intermittent group performance; (e) external pace, regular interval individual performance; (f) external pace, serial group performance; and (g) external pace, continuous group performance. Pupil choice contains 10 subdimensions, depending on whether there is a task; who selects the task (teacher, target child, or peer); and how much freedom the target child has in structuring task demands (no structure by target child, partial structure by target child, or total structure by target child).

The 13 SCAN dimensions include (a) distractibility, in which the child's attention is diverted from the task; (b) nonparticipation/passivity; (c) nonconstructive, self-directed activity, such as inappropriate toying with materials or one's clothes; (d) constructive, self-directed activity, referring to independent work without direct teacher supervision; (e) constructive play, such as games or extracurricular activities; (f) constructive participation, i.e., attending to or following directions of the teacher; (g) task-oriented peer interaction/conversation, in which the child interacts verbally or nonverbally with a peer regarding an appropriate classroom task; (h) teacher interaction/conversation, in which the child interacts verbally or nonverbally with the teacher about a task or non-task topic; (i) peer social interaction/conversation, in which the child interacts with a peer regarding non-task topics; (j) dependency of the child toward the teacher; (k) appropriate gross motor activity, as in cleanup or work preparation; (l) inappropriate gross motor activity which is not related to the task; and (m) aggression/manipulation/persistence toward the teacher or a peer.

Results

Classroom setting subdimensions or categories tend to cluster into three main "action structures," which account for approximately 91% of the total number of observations. The first action structure is "independent seatwork," comprising about 34% of all observations. The second action structure, "whole-class recitation," is found in approximately 33% of the observations. "Continuous central signal emission," as in teacher reading or movie viewing, is the third major action structure. It covers roughly 24% of the observations. The frequencies and defining features of the three action structures are shown in Table 1.

Insert Table 1 about here

These kindergarten action structures are strikingly similar to the action structures found by Gump (1967) in third-grade classrooms.

For the purposes of this study, only the frequencies of off-task SCAN behavior categories (distractibility; nonparticipation/passivity; nonconstructive, self-directed activity; peer social interaction/conversation; dependency; inappropriate gross motor activities; and aggression/manipulation/persistence) are examined. The average frequencies of behavior in each of these seven categories based on 240 observations per subject are shown in Table 2.

Insert Table 2 about here

Since the mean frequencies of dependency and aggression were extremely low, these categories of behavior were eliminated from further analyses.

Preliminary analysis indicated no differences between males and females for any of the five frequently occurring off-task SCAN categories (distractibility; nonparticipation/passivity; nonconstructive, self-directed activity; peer social interaction/conversation; and inappropriate gross motor activities). Further analyses, therefore, are collapsed across sex of subject.

Effects of Action Structures on Off-task Behavior

The theory of signal continuity suggests that the more continuous the signal in a lesson, the less off-task behavior will occur. Based on this theory, it was hypothesized that continuous central signal emission, having the highest degree of signal continuity, would be associated with the least amount of off-task behavior; that independent seatwork would have somewhat more off-task behavior; and that whole-class recitation, with the least signal continuity, would display the greatest amount of off-task behavior.

Multivariate analysis of variance (MANOVA) was used to examine the effects of the three main action structures on off-task behavior. Each child's first observation session was categorized by action structure (independent seatwork, whole-class recitation, or continuous central signal emission). Dependent variables were the five commonly occurring SCAN off-task categories: distractibility; nonparticipation/passivity; nonconstructive, self-directed activity; inappropriate gross motor activity; and peer social interaction/conversation. To test the hypotheses of

this study, all possible pair-wise comparisons were made. Alpha was set at .10 for this exploratory study, and Dunn's procedure (Kirk, 1968) for nonorthogonal, a priori contrasts was used. Dunn's procedure involves setting the alpha level for a collection of comparisons, instead of for each individual comparison.

No significant differences in off-task behavior were found in the contrast between independent seatwork and continuous central signal emission. However, significant differences in the predicted direction occurred in the two other contrasts. Students exhibited significantly more off-task behavior in whole-class recitation settings than while doing seatwork independently, F (5, 13) = 3.76, $p < .05$. The univariate F-tests indicate that students were more distractible, F (1, 17) = 9.55, $p < .01$; more nonparticipatory/passive, F (1, 17) = 8.43, $p < .01$; and more nonconstructively self-directed, F (1, 17) = 6.62, $p < .05$, in whole-class recitation than in independent seatwork.

The second significant contrast indicated that students more frequently engaged in off-task behaviors in whole-class recitation settings than in those settings characterized by continuous central signal emission, F (5, 13) = 3.058 $p < .10$. Univariate F-tests indicate that students were more distractible, F (1, 17) = 6.04, $p < .05$; more nonparticipatory/passive, F (1, 17) = 7.22, $p < .05$; and more nonconstructively self-directed, F (1, 17) = 4.71, $p < .05$, in whole-class recitation than in lesson formats

which are marked by continuous central signal emission. These results support previous conclusions concerning the importance of continuous signal emission for maintaining on-task behavior (Kounin & Gump, 1974; Kounin & Doyle, 1975).

Since both action structures, whole-class recitation and continuous central signal emission, occurred in large group settings, group size should not be considered in any causal relationship with student behavior without reference to other milieu dimensions. These results support Rosenshine's (Note 3) implication that group size may not be as important as other setting variables.

To explore further the premise that setting influences behavior independently of individual differences in personality or cognition, a repeated measures analysis was conducted using the three off-task behaviors found to be significant in the contrast between independent seatwork and whole-class recitation. All subjects who were observed in both action structures ($n = 7$) were used in this analysis. For each subject, calculations were made of the difference in frequency of each of these three off-task behaviors in independent seatwork and whole-class recitation. Differences scores for distractibility; nonparticipation/passivity; and nonconstructive, self-directed activity were used as dependent variables. The results of this MANOVA confirm the findings of the previous test, i.e., individuals exhibit more off-task behavior in whole-class recitation settings than while engaged in independent seatwork, $F\ (3, 4) = 8.7$, $p < .05$. Univariate F-tests indicate that the three dependent variables contribute almost equally to this difference.

A similar analysis was not possible for the contrast between whole-class recitation and continuous central signal emission because there were not enough children who were observed in both of these action structures.

Anecdotal Information on Lulls

Although there were not enough observations of lulls to make any definitive statements, anecdotal information showed some interesting trends in the data. In continuous central signal emission situations, lulls of longer durations (i.e., 20 seconds or more) affected task-related behavior more than did shorter lulls, especially if the central emitter was a teacher rather than a filmstrip or a movie. With a filmstrip or movie as central emitter, the end of a long lull appeared to bring students back on task. However, with the teacher as central emitter, the end of a long lull did not necessarily bring the students back on task.

Children's conditioning by television may play a part in this. The continuity of television viewing is periodically interrupted by a 30-second lull in the form of a commercial. Children have been trained to "tune back in" after a commercial, and this function may transfer to filmstrip or movie viewing. The return to task may not be practiced as often with human emitters as with mechanical ones (Williams, Note 4).

The relationship among (a) student behaviors, (b) length of lulls, and (c) nature of central emitter, human or mechanical, deserves further research. The significance of lulls as a manifestation of lowered signal continuity has been noted by previous researchers (Gump, 1974; Kounin, 1970; Kounin & Doyle, 1975; Kounin & Gump, 1974; Sherman 1975).

Discussion

The ecological dimensions of lessons were studied more profitably in clusters (action structures) than singly, because certain categories tended to appear together. The three most typical action structures, which accounted for 91% of the observations, were independent seatwork, whole-class recitation, and continuous central signal emission.

Based on the theory of signal continuity, it was hypothesized that continuous central signal emission would be associated with the least amount of off-task behavior, independent seatwork would show more off-task behavior, and whole-class recitation would exhibit the most off-task behavior. Two of the three hypotheses were upheld. The lack of significant differences in off-task behavior between independent seatwork and continuous central signal emission may possibly be explained by the small number of subjects involved in this exploratory study.

This study's results support the assumptions of ecological psychology concerning the importance of setting variables in affecting students' behaviors, regardless of individual differences in cognition or personality. A major implication of this study is that teachers may need to reassess

their classroom role. They may need to see themselves as classroom setting managers. In constructing and controlling the setting, the teachers' proximate aim would be to increase students' on-task behavior, and their ultimate aim would be to increase students' achievement .

Reference Notes

1. Gump, P. V. Code for open vs. traditional (architecture) schools. Unpublished manuscript, University of Kansas, 1971.

2. Morrison, S. B., & Oxford, R. L. Classroom Ecology Scale. Unpublished manuscript, University of North Carolina, Revised January 1978.

3. Rosenshine, B. V. Primary grades instruction and student achievement gain. Paper presented at the meeting of the American Educational Research Association, New York City, April 1977.

4. Williams, A. Personal communication, December 5, 1977.

References

Gump, P. V. The classroom behavior setting: Its nature and relation to student behavior. (Final report to U. S. Office of Education Project No. 5-0334, Contract No. OE-4-10-107). Lawrence, Kansas: University of Kansas, 1967.

Gump, P. V. Operating environments in schools of open and traditional design, School Review, 1974, 82, 575-593.

Kirk, R. Experimental Design: Procedures for the Behavioral Sciences. California: Brooks, Cole Publishing Co., 1968.

Kounin, J. S. Discipline and group management in the classroom. New York: Holt, Rinehart & Winston, 1970.

Kounin, J. S., & Doyle, P. H. Degree of continuity of a lesson's signal system and the task involvement of children. Journal of Educational Psychology, 1975, 67, 159-164.

Kounin, J. S., Friesen, W. V., & Norton, A. E. Managing emotionally disturbed children in regular classrooms. Journal of Educational Psychology, 1966, 57, 1-13.

Kounin, J. S., & Gump, P. V. Signal systems of lesson settings and the task-related behavior of preschool children. Journal of Educational Psychology, 1974, 66, 554-562.

McKinney, J. D., Mason, J., Perkerson, K., & Clifford, M. Relationship between classroom behavior and academic achievement. Journal of Educational Psychology, 1975, 67, 198-203.

Sherman, L. W. An ecological study of glee in small groups of preschool children. Child Development, 1975, 46, 53-61.

Shulman, L. S. Reconstruction in educational research. Review of Educational Research, 1970, 40, 371-396.

Stodolsky, S. S. Ecological psychology or what's going on at Kansas? School Review, 1971, 79, 625-636.

Footnotes

This research was conducted under the auspices of the research training program at Frank Porter Graham Child Development Center. We gratefully acknowledge the support and assistance of this program.

Table I

Frequencies and Defining Features of Three Most Common Action Structures

Action Structure	Percent of Total No. of Observations	Teacher Role	Pupil Activity	Pupil-Pupil Relationship	Action Sequencing	Group Size	Pupil Choice	No. Teache in Segmen
Whole class recitation	33	Recitation Leader	Attending to group events/ no product	Interdependent	External pace/intermittent group performance	Large	Teacher selects task/ no structure by target child	Variable
Continuous central signal emission	24	Reader, equipment/media-handler, instructor/ lecturer or direction giver	Attending to group events/ no product	Parallel	External pace/no performance	Large	Teacher selects task/ no structure by target child	Variable
Independent seatwork	34	Not in segment	Attending to materials/ product	Private	Self pace/ individual performance	Small	Teacher selects task/ no structure by target child or teacher selects task/ partial structure by target child.	None

Table 2

Mean Frequency of Behavior in Each Off-task SCAN Category
(Out of a Total of 240 Every-Five-Second Observations)

Variable	$\bar{X}$
Distractibility	26.45
Nonparticipation/passivity	14.05
Noncontructive self-directed activity	7.35
Peer social interaction/conversation	8.55
Dependency	2.15
Inappropriate gross motor activities	4.05
Aggression/manipulation/persistence	0.10